

# Traffic Report by Friends of Berkhamsted Opposing the Planning Application for



## The Proposed Multi-Storey Car Park at Lower Kings Road Berkhamsted No:4/00122/16/MFA

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## **Appendices**

<b>A</b>	<b>Traffic Survey Specification</b>
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## 1. Executive Summary

This report shows that:

- The junctions used to access the proposed MSCP will not accommodate the additional traffic.
- To such an extent that traffic will queue well beyond the station in Lower Kings road for an extended period – not just at peak periods.
- The MSCP will not give a return on investment – it will not even pay back the capital cost.
- The MSCP long-stay parking is supposed to be designed to serve rail commuters but they will not give up their free on-street parking to use the MSCP.
- The MSCP short stay parking is not needed because there is adequate parking in other car parks even at peak periods – this is not signed properly.
- Traffic levels are declining year-on-year so more parking is not needed.
- The design of the MSCP is unsafe for the disabled, pedestrians and cyclists. It contravenes the National Planning Policy Framework and will not get PARK MARK accreditation.
- The MSCP will not contribute to the local economy nor help make Berkhamsted more vibrant. In fact, by closing the existing lower Kings road car park during the construction period, it could make the local economy worse.

## 2. Introduction

This report has been written by Friends of Berkhamsted who oppose the planning application for a proposed multi-storey car park (**MSCP**) in Lower Kings Road, Berkhamsted, planning application number 4/00122/16/MFA.

Traffic accessing the existing Lower Kings road car park already experiences long queues and delays, especially at peak times, as shown by the following photo of traffic queuing on Lower Kings road to get into Waitrose car park on Jan30th 12.00noon. The extra traffic and queues generated by the MSCP will significantly detract from Berkhamsted's appeal and charm.



## 3. Junction Capacity

### 3.1 Summary

The White, Young Green (**WYG**) report did not take account of all the constraints at the junctions connecting Lower Kings Road to the proposed multi-storey car park (**MSCP**). They ignored the effect of the barrier into Waitrose car park (**the barrier**), the pedestrian crossing and they just considered the junctions in isolation not in combination. If all these are considered, then the junctions would not be able to cope. This chapter outlines the evidence.

To find out if the junctions could cope with the additional car park traffic, we developed a PARAMICS traffic model of the junctions from Lower Kings Road into the MSCP which takes account of all the features which affect the ability of the road system to cope with the additional car park traffic including the junctions, how they interact, the barrier into Waitrose car park and the pedestrian crossing. As well as being able to model the junctions (which WYG did with the PICADY software), PARAMICS deals with individual vehicles and traces their path through the road system. It is therefore the correct way of representing the way each vehicle negotiates the junctions, barrier and pedestrian crossing so as to assess the suitability of the road system to accommodate the additional MSCP traffic.

The conclusions from this model is that the traffic could be queued back along Lower Kings road from the entrance to the car park to beyond the railway station. This will bring the town centre to a stand-still and the delays which drivers experience will be horrendous. (The DBC Cabinet Meeting on 11/2/14 identified Key Risks as “the scale and the traffic impact will need to be considered carefully both of which will have effect on the viability of the venture”)

### 3.2 Our Traffic Survey

WYG identified Saturday as the busiest time of the week with a peak between 10.45 am and 12.15 am and, like WYG, we have modelled this period. WYG did not survey the details of the barrier opening and closing and the effect this had on the traffic. Nor did they collect details of the pedestrians crossing the car park junction and the effect this had on traffic. Nor did they survey the interaction between these and the two priority junctions. Accordingly, we undertook our own traffic survey on two Saturday mornings in 2016 (30 January, and 13 February 2016) from 10.45 am for one and a half hours to 12.15 pm. This survey measured the manual classified traffic turning counts (**MCC**), car park occupancy, pedestrian flows, barrier opening and closings and queues in each quarter hour period. The survey specification is given in Appendix A.

The results were used to develop the demand origin-destination matrices which were coded into the PARAMICS traffic model. These matrices contained the number of vehicles travelling between every origin and destination in each quarter hour period. They had the following origins and destinations:

1. The station in Lower Kings road
2. Kings Road 100 metres back from its junction with the High Street

3. 100m inside Waitrose car park downstream from the barrier
4. The small car park to the north of the barrier access road
5. The main car park
6. The service road which goes round the main car park

The pedestrian counts were used to code the pedestrian crossing into PARAMICS. The survey was also used to calculate the vehicle mix. The 5-minute interval profile within each quarter hour period was taken as flat (ie all 5-minute intervals carried the same proportion of the traffic).

The barrier opening and closing pattern was critical to the ability of the junctions to cope with the traffic and for the PARAMICS model this was taken from the survey results. The interval between barrier openings was grouped into frequency intervals of 30 second intervals (ie the number of times the barrier opened after 0-30 seconds, after 30-60 seconds etc) up to one and a half minutes. This was used to set the randomised barrier openings in the PARAMICS model.

Observations longer than one and a half minutes were ignored. One such time occurred in the survey when the barrier was down for such a long time that the driver pressed the help button. Waitrose apologised and opened the barrier after about 8 minutes causing considerable traffic congestion. According to other drivers commenting at the time, this was not an unusual occurrence. When it does happen the traffic queues can quickly build up to be quite extensive. Therefore, actual traffic conditions with the proposed MSCP could be much worse than the PARAMICS results we present.

### **3.3 Development of the PARAMICS Traffic Model**

The road network between each of the origins and destinations was coded into the PARAMICS traffic model as shown by the grey roads (see figure 3.1). This was put onto a picture of the surrounding buildings etc to illustrate their location. To this was added the barrier into Waitrose car park and the pedestrian crossing. The extent of the network is shown in Figure 3.2 which included an abbreviated version of the signalised junction of Lower Kings road. Figures 3.1 and 3.2 were captured as images from a run of the PARAMICS traffic model's visualisation where cars are represented in blue, vans and goods vehicles in white.

The PARAMICS traffic model was run with the traffic survey demand data to simulate the traffic situation for the survey period (Saturday 10.50 am to 12.15 noon). The micro-simulation was found to visually reproduce the existing situation as shown in figures 3.1 and 3.2. The complete simulation is given as a video on the USB supplied with this report (see Appendix B).

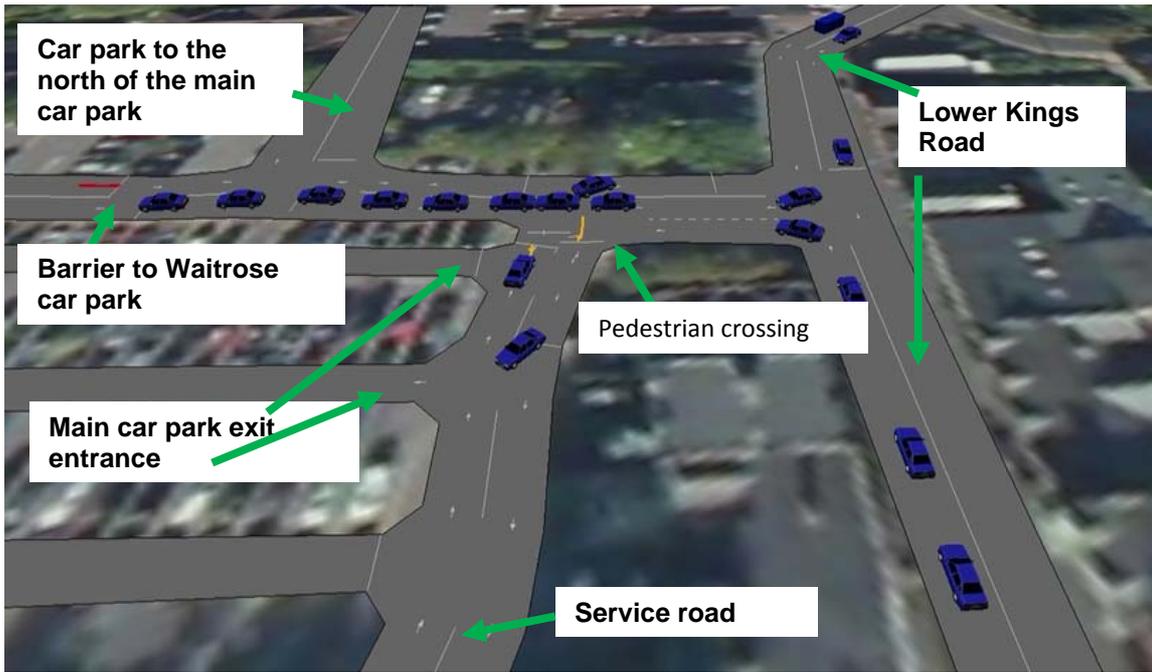


Figure 3.1 PARAMICS Traffic Model Road Network



Figure 3.2 The Extent of the PARAMICS Traffic Model Road Network

The queues given by the model were compared with those found on the survey (see figure 3.3) so as to check that the model was correct. The PARAMICS traffic model is a micro-simulation model which has a degree of randomness in the decisions drivers take. As a consequence, it is necessary to take the average of (in our case) five model runs to give the average queue lengths. The results show (see Table 3.1) that the average queue length given by the model was 3.65 vehicles which matches closely with the 4.67 observed in the survey. The model therefore reproduces the existing situation sufficiently well to be able to use it to draw conclusions about the effect of changing the demand and road network.



Figure 3.3 The TB Traffic Surveyed Queues

Q1 High St to Service Rd	Observed	Synthesised	Diff	Percent	Run 1	Run 2	Run 3	Run 4	Run 5
Average	10.94	6.36	-4.58	-42%	5.45	6.62	4.43	7.29	8.00
Maximum Length	15	14.4	-0.60	-4%	14	15	13	12	18
Q2 Main Rd to High St									
Average	1.56	1.84	0.28	18%	3.01	0.00	4.21	0.00	2.00
Maximum Length	11	4.40	-6.60	-60%	6		14		2
Q3 Main Rd to Station									
Average	6.94	7.56	0.62	9%	3.08	2.00	28.03	2.62	2.10
Maximum Length	30	16.60	-13.40	-45%	12	2	62	4	3
Q4 Barrier									
Average	7.18	3.21	-3.97	-55%	4.15	2.00	5.58	2.33	2.00
Maximum Length	10	7.20	-2.80	-28%	13	2	15	4	2
Q5 CP1 to Main Rd									
Average	0.27	2.11	1.84	680%	2.08	2.27	2.18	2.00	2.00
Maximum Length	1	2.80	1.80	180%	3	4	3	2	2
Q6 CP2 to Service Rd									
Average	1.11	0.81	-0.30	-27%	2.00	0.00	2.05	0.00	0.00
Maximum Length	5	1.00	-4.00	-80%	2		3		
Average for all Queues									
Average	4.67	3.65	-1.02	-22%					
Maximum Length	12.00	7.73	-4.27	-36%					

Table 3.1 Comparison of Modelled (Synthesised) and Observed (in the TB survey) Average Queue Lengths used to Check that the PARAMICS Traffic Model is Correct

### 3.4 Modelling the Traffic Access to the Multi-Storey Car Park if Built Today

The proposed MSCP was put into the PARAMICS traffic model to assess its traffic implications. The demand for the proposed MSCP was taken from the WYG report and added to the survey demand already coded into the model. WYG changed the priority of the car park access with the road leading to the barrier so we adopted their design in our model. We therefore put the MSCP into our model exactly as WYG had put it into their calculations.

The results from running the model show that traffic queues build-up, partly as a results of vehicles trying to get through the barrier and partly by the additional vehicles entering the MSCP, to such an extent that at their peak traffic is queued back along Lower Kings road beyond the station in one direction and in the other, through the junction with the high street, into Kings Road and up the hill for some 40 vehicles. The full visualisation of the micro-simulation is included on the USB (see appendix B) with snap-shots from it shown below in figures 3.4 to 3.7. The PARAMICS traffic micro simulation finished at 12.15 noon with queues along Lower Kings road 21 vehicles beyond the station and on Kings road at least 40 vehicles up the hill. We did not model beyond 12.15 noon but these results indicate that these queues could continue well into Saturday afternoon.

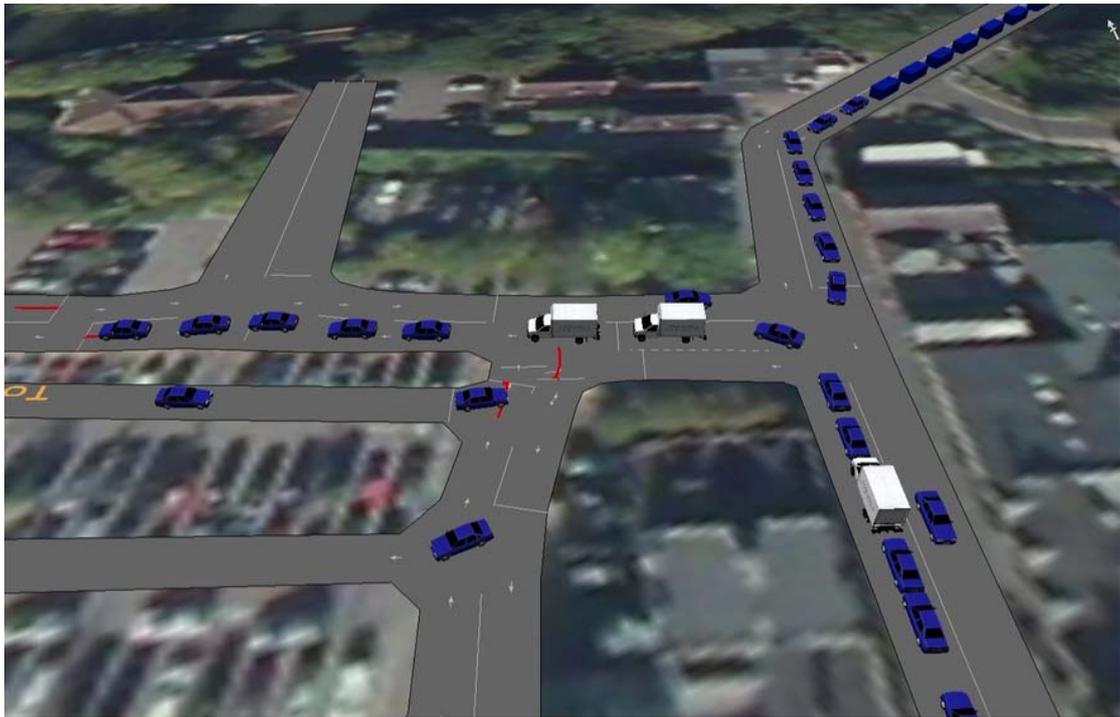


Figure 3.4 PARAMICS Traffic Model Visualisation for Saturday 11.25 am with the MSCP, showing the queues built up from the barrier to Waitrose car park due to the extra traffic waiting to get into the MSCP.



Figure 3.5 PARAMICS Traffic Model Visualisation for Saturday 11.39 am with the MSCP, showing the queue that has built up on Kings road. The number 42 indicates the additional 42 cars in the Kings road queue which are not shown on the display.



Figure 3.6 PARAMICS Traffic Model Visualisation for Saturday 11.54 am with the MSCP, showing the queue that has also built up on Lower Kings road stretches back to the station with the additional 36 cars beyond the station not shown on the display.



Figure 3.7 PARAMICS Traffic Model Visualisation for Saturday 12.13 am with the MSCP, showing that the Lower Kings road queue has 21 cars beyond the station and 40 cars up the Kings road hill not shown on the display.

## **4. Business Case**

### **4.1 The Applicants Business Case**

There is no good business case for the car park. And there is no business plan in the planning application.

The Dacorum Borough Council cabinet meeting of 11/2/14 states: “The corporate objectives were to drive value for Council owned assets and provide a reasonable return on capital employed.” In fact this objective was not achieved because the business case has not been prepared (see below) so it cannot yet be established that “a reasonable return on capital” can be achieved for the MSCP proposal.

In April 2013 WYG was appointed to do a feasibility and commercial viability of site by Cllr Nicholas Tiley, Finance and Governance. “The justification for the investment will be set out in phase 1 business case. The project will require circa £3.5 million of capital to deliver and should generate revenue of around £200,000 pa subject to business plan”.

A feasibility study and commercial viability assessment report (phase 1) was produced in January 2014 to provide a reasoned evaluation of the potential revenue and contrast this with capital and operational costs of the new facility (quote from the planning application P51 7.2). Financial analysis was undertaken based on different configurations in both the total number of spaces and blend of short term and long term bays. The final configuration would be subject to further refinement following more detailed consultation in phase 2 of the project. Mr D Gauke wrote to Mr N Brown (who has put in the planning application) to ask him what the business case was. He replied on 22<sup>nd</sup> January 2016 that “a mix of short and long term places is yet to be confirmed” (presumably then a business case had not therefore been prepared).

### **4.2 Our Version of the Business Case**

The revenue the MSCP is expected to achieve is £200,000 pa. From our analysis of the WYG’s car park occupancy survey and the quoted tariff, we estimate that the current car park revenue to be of the order of £150,000 pa. The MSCP will therefore achieve an additional £50,000 pa. The additional costs of the MSCP are likely to include the following with an estimate of their magnitude:

1. Additional operating costs £40,000 pa
2. Interest on the capital @ 3%pa £100,000 pa

This is illustrated in Table 4.1 for the first 20 years which assumes that *all* the revenue, not just the £50,000 surplus, is used to pay off the capital and give a return on investment. On this basis the MSCP will still owe over £1million pounds after 20 years and will not give a return on investment because it wouldn’t have paid off its debts in the first 20 years.

Year		Income	Expenditure	Interest	depreciation	Bank borrowing
1	2016	-	3,340,500	100,215	55,675	3,440,715
2	2017	200,000	116,749	103,221	55,675	3,343,936
3	2018	200,000	116,749	100,318	55,675	3,244,255
4	2019	200,000	116,749	97,328	55,675	3,141,582
5	2020	200,000	116,749	94,247	55,675	3,035,830
6	2021	200,000	116,749	91,075	55,675	2,926,905
7	2022	200,000	116,749	87,807	55,675	2,814,712
8	2023	200,000	116,749	84,441	55,675	2,699,153
9	2024	200,000	116,749	80,975	55,675	2,580,128
10	2025	200,000	116,749	77,404	55,675	2,457,531
11	2026	200,000	116,749	73,726	55,675	2,331,257
12	2027	200,000	116,749	69,938	55,675	2,201,195
13	2028	200,000	116,749	66,036	55,675	2,067,231
14	2029	200,000	116,749	62,017	55,675	1,929,248
15	2030	200,000	116,749	57,877	55,675	1,787,125
16	2031	200,000	116,749	53,614	55,675	1,640,739
17	2032	200,000	116,749	49,222	55,675	1,489,961
18	2033	200,000	116,749	44,699	55,675	1,334,660
19	2033	200,000	116,749	40,040	55,675	1,174,700
20	2033	200,000	116,749	35,241	55,675	1,009,941

Table 4.1 Business case bank balance and annual losses

## **5. Scheme Objectives**

### **5.1 What is the purpose of a multi-storey car park in Lower Kings Road?**

The Planning application submitted 20/1/16 states “The purpose of the development is to resolve existing parking limitations in the town centre in order to support future trade and local businesses” (P25. 4.2).

However, WYG assumed that the long stay parking (150 places) would be used primarily by rail commuters not businesses. Only 39 extra short stay places would be available for shoppers and visitors on weekdays, on weekends a proportion of long stay places would be converted to short stay places. Sample surveys were carried out by WYG of all on-street parking which was within five minutes walk of the High Street/ Lower Kings Road/ Kings Road junction. This showed that these streets were used for residential parking and suggested some streets were also used for rail commuter parking. WYG’s feasibility study “identified rail commuter usage as the potential primary patronage generator” of the MSCP (P34 5.7). Long stay spaces will be used by rail commuters (suppressed latent demand-vehicles that would use the MSCP but would currently be parked elsewhere) and these rail commuters may change their habits of parking in the residential streets and park in new MSCP. Their feasibility study showed “it is expected that as more parking provision is offered at the site, the town centre will experience a shift in parking practices that would translate into vehicles currently parked elsewhere, parking at the proposed MSCP” (P36 5.13)

The MSCP is now proposed for rail commuters not for the original purpose to “support future trade and local businesses”

### **5.2 Why rail commuters won’t use the MSCP**

Street car parking for rail commuters is free. The residents voted out Controlled Zone Parking in 2002 and 2012 so the council have to respect their wishes, so commuters will not change their behaviour and even if they did there is ample parking in the rail station and St Johns Well car park.

AECOM’s Urban Transport Plan for Herts County Council (May 2013 Volume 1 Executive Summary P65 8.5.4) says: “However some commuters prefer to park in nearby residential areas in order to avoid parking costs even with spare capacity being available at the station”.

The parking survey for the Rail Station car park done by WYG June 2013 on Thursday show that before 0800 there are over 203 spaces available. There is expected to be no further growth in car usage in the future (Appendix C of their report).

Parking surveys for St Johns Well car park were not included by WYG when looking at long term parking needs - only the Rail station car park was surveyed: “vehicle arrivals and departures, parking accumulation and percentage of occupancy data has been extracted from this data for the existing Lower Kings Road as well as the Rail Station Car Park” (P51 7.7). St

Johns Well has the only long stay bays the council own in Berkhamsted town centre. A survey, done at St Johns Well long stay car park on a weekday in June 2013, found that before 0800 am, when most rail commuters would have parked, there were 48 spaces available for them and before 0900 am there were 20 spaces available.

The station car park is only fractionally more expensive if you buy an annual season ticket. £3.60 a day as opposed to £3.50 a day at the council run long term car park in St Johns well. The station car park is more convenient for commuters. The St Johns Well car park is a 7 min walk away from the station.

In summary: some commuters prefer to park on-street free even if there are spaces in the rail station and St John's Well car parks so they are unlikely to change their habits to park at the MSCP.

### **5.3 The Objective of MSCP is to provide shoppers and visitors with 39 more parking spaces at weekdays and more short stay parking spaces week ends**

To meet the objective of more parking spaces for shoppers and visitors WYG say that: "long stay provision would be available for short stay parking during the weekend to accommodate the increased town centre visitor/shopper activity". (WYG report P28 4.16).

There is no growth in traffic – in fact for the past 10 years there has been a year on year reduction so extra spaces are not needed. As attested by WYG: "A review of Annual Average Traffic Flow (AADFs) from Department of Transport in several locations within the vicinity of the site has been carried out which shows that as a whole there has been no growth in traffic flows over the most recently available 5 year period (2009-2014)" (WYG report P37 5.17). Also AECOM in their Urban Transport Study commissioned by Herts County Council in May 2013 found most people use car as transport but between 2001-2010 the car mode share of Berkhamsted decreased by 5.6%, and walking increased by 4.9%.

The 6 car parks in the town centre are not full at the moment so extra spaces will not be used. AECOM showed in its Urban Transport Pan for HCC in May 2013 that there was adequate short term car parking in the 6 Town Centre car parks and on the High Streets Pay and Display. There just had to be better Car Park Signage and use of car parking as follows: ". .greater efficiency of existing parking provision through an improved signage strategy and prioritisation of non- commuter parking in Town Centre -making more use of existing assets." (Volume1. Executive Summary P.8) They also showed that; "Signs to car parks are in poor condition and misleading" (P37 Table 4.6). They also said that "but also to provide live information of available parking at key destinations (variable message signs)" (P66)

There is sufficient parking even in the peak - it is just of matter of directing the shoppers to the available parking. This is illustrated as WYG showed in their June 2013 car parking survey that there is adequate short stay car parking for shoppers and visitors. (Transport Assessment in Planning Application

Appendix C). However they chose to show the short stay parking in the Lower Kings Rd car park only. The Lower Kings Road car park only gets full for approximately 30 mins at around 1200 on Saturdays. However at around this time there is availability in the Water Lane Car Park behind Tesco (11 places available), the Canal Field Car Park (free parking for 2 hrs with 19 places available), Waitrose car park (18 places available), Tesco has 20 places in its basement. Water Lane Car Park behind Tesco gets full Saturdays 1000, 1300, 1500, when there are places at Lower Kings Road of 47, 11, and 21 respectively and St Johns Well short stay parking, 3,8,5 places Canal Fields 26, 24 and 4 places respectively. Waitrose 5, 36, and 6 respectively.

#### **5.4 Shoppers at Waitrose will not be able to use the Short Term MSCP Spaces**

The MSCP has no provisions for Waitrose shoppers i.e. lift takes 8 people (therefore lift will not take trolleys), no trolley parks, in western section of car park there are no stairs from ground floor to first floor. At the moment on Saturdays if cars wanting to shop in Waitrose find the Waitrose car park is full and the queues are too long they go into the Lower Kings Car park and pay, then shop at Waitrose and bring their trolley into the car park which is accessible and has trolley parks. They won't be able to do this.

## 6. Safety for Pedestrians, Cyclists and the Disabled

Minutes from Dacorum Borough Council Cabinet meeting 11/2/14 state that

“The corporate objectives are to maintain a safe and clean environment”.

“The designs for the proposed MSCP will meet the standards set to achieve PARK MARK accreditation as a minimum which means the design will meet acceptable standards for personal safety, vehicle security and be fully accessible to all members of society. Step free access to all storeys will be achieved via lifts and in the event of an emergency via vehicular ramps”. (13)

The design of the MSCP does not achieve Park Mark Accreditation. This is shown by WYG who state: “This means that people parking on levels 3,5 and 7 and using the lift would have to walk down a flight of stairs to gain access to the ground floor” (Planning Application P32 4.35).

National Planning Policy Framework (NPPF, March 2012) requires authorities to: “create safe and secure layout which minimises conflict between traffic cyclists and pedestrians, avoiding street clutter” (P5 2.9). However, this will not be achieved:

- There will be 15 disabled spaces housed in Car Park 1 near the Waitrose entrance in conflict with the cars accessing Waitrose. WYG states that: “Blue Badge holders would drive towards the Waitrose Car Park access to park outside the proposed MSCP building.” (P30 4.22) They have to also park and get out of their parking bay straight into the paths of the Waitrose car park vehicles. As there are queues at this barrier this is a dangerous and chaotic situation.
- There is no pedestrian crossing for the disabled to access the High Street or Lower Kings Road from their disabled parking bays and they either have to cross at the large junction of the service road onto Lower Kings road or cross through the cars queuing to get into Waitrose.
- A cycle point is proposed near Waitrose barrier and Car Park 1, this will cause further chaos and danger
- The entrance from Lower Kings road is very wide because large delivery lorries to Waitrose need turning space. A lot of pedestrians cross here. The extra MSCP traffic will make this even more dangerous.

## **7. Local Business & Town Centre Vibrancy**

The MSBC will not contribute to the local economy or town centre vibrancy because:

- There is no evidence that WYG in their planning application have asked the opinion of businesses.
- The long stay places are for displaced rail commuters, who will park their cars close to the town centre and then leave the town and not contribute to its economy or vibrancy
- It is poor transport practice to put rail commuter parking so close to the town centre. This was confirmed by AECOM's Urban Transport Plan (for HCC in May 2013 Volume 1. Executive Summary P8) where it desired to "improve the prioritisation of non-commuter parking in the town centre"
- Lower Kings Rd Car Park will be closed while the MSCP is being built so that will have a detrimental effect on businesses.

## 8. Conclusions

The main conclusions are that:

- The junctions used to access the proposed MSCP will not accommodate the additional traffic.
- To such an extent that traffic will queue well beyond the station in Lower Kings road for an extended period – not just at peak periods.
- The MSCP will not give a return on investment – it will not even pay back the capital cost.
- The MSCP long-stay parking is supposed to be designed to serve rail commuters but they will not give up their free on-street parking to use the MSCP.
- The MSCP short stay parking is not needed because there is adequate parking in other car parks even at peak periods – this is not signed properly.
- Traffic levels are declining year-on-year so more parking is not needed.
- The design of the MSCP is unsafe for the disabled, pedestrians and cyclists. It contravenes the National Planning Policy Framework and will not get PARK MARK accreditation.
- The MSCP will not contribute to the local economy nor help make Berkhamsted more vibrant. In fact, by closing the existing lower Kings road car park during the construction period, it could make the local economy worse.

## **Appendix A: Outline of the Berkhamsted Surveys on Lower Kings Road**

### **Notifications**

We recommend that the Council and Police are informed by the supervisor prior to the surveys. In particular, the purpose of the survey should be explained. Any issues about permission can be resolved at this stage.

A letter should be prepared by the supervisor that can be shown to members of the public who may challenge surveyors about what they are doing. This should explain clearly and concisely the purpose of the surveys as well as confirm that all relevant permissions have been obtained.

### **Risk Assessment and Health and Safety**

We recommend that the supervisor carries out a risk assessment prior to the surveys, in order to guarantee the safety of the surveyors and the public (details on the Health and Safety website). High visibility vests are recommended for all members of the survey team.

### **Types of Survey**

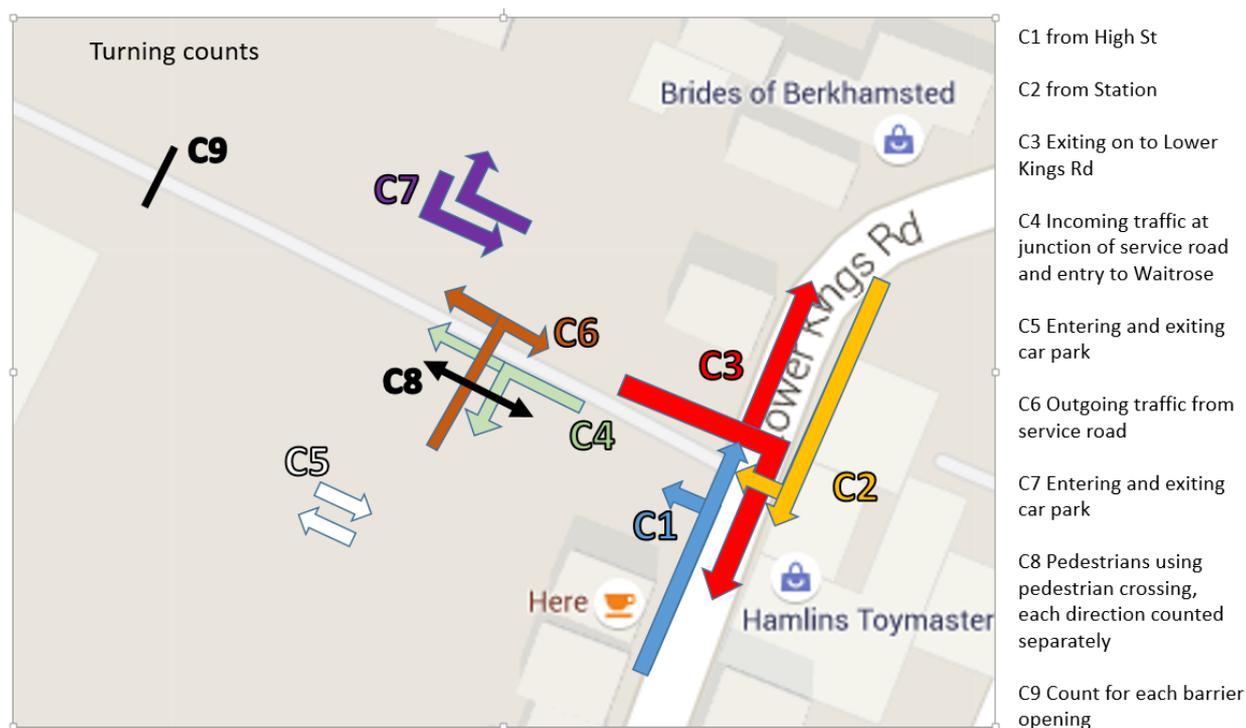
Seven turning count surveys, two crossing count surveys, six queue length surveys and two before and after car park count surveys. The surveys should begin before 10.45 and finish after 12.15. The car park count should be taken immediately before the main survey starts with no vehicles being missed in between and immediately when the main survey ends without missing any vehicles. The supervisor should blow a whistle every 15 minutes and the counters should start a new form filling in the details at the top. If a survey does not begin at a quarter-hour period, start the count at that time and make sure to finish on a quarter-hour period, e.g. Begin at 10.40 and finish at 10.45, for that first quarter hour period.

One enumerator is to walk around recording the queue lengths Q1, Q2, and Q3. Another enumerator is to record queue lengths Q5 and Q6. These are to be recorded in turn and when each queue length has been recorded, the enumerator is to go round again recording each queue length in the same cycle.

Queue length Q4 is to be recorded by the enumerator who will also record the Waitrose car park barrier count. These two counts will be recorded on one form. The enumerator carrying out this count should record the start time and the queue length at the start for each interval. An interval being each time the barrier stays down for a prolonged amount of time – at least 3 mins. In each interval they should tally how many times the barrier goes up. When the barrier stops letting vehicles in for at least 3 mins due to full capacity, the enumerator should note down the queue length for the end of that interval. Then they should move onto a new count box, noting down the start time and the length of the queue at the start and end of the period. A new count box should be used again if the barrier has been down for over 3 mins, in this case there will be no tally but just a count for the queue length at the start and end

of the period. When the barrier starts letting vehicles in again, the enumerator should continue to tally the number of times the barrier goes up and record the length of the queue when the barrier stops letting vehicles in just as before.

The pavement can be marked up with chalk marks in intervals of 2 car lengths as the queues build up so that the queue lengths can be recorded as the number of vehicles. The crossing count surveys for the pedestrian crossing and Waitrose car park barrier are to be counted in 15 minute intervals as well.



Locations of turning counts

### Duration of Survey

Each survey should be 1.5 hours long at the busiest time, for example

- Saturday 10.45 to 12.15am
- Monday 3.45pm to 5.15pm
- Friday 3.45pm to 5.15pm

### Role of Supervisor

The supervisor is to assist individual members of the team and provide relief if needed. Any unusual incidents should be logged by the surveyor; for example, a car parking on Lower Kings road and causing delays. The approximate position of the queue length chalk marks should be marked on a map and photographed at the end of the survey period.



Locations of the queue length surveys and the before and after car park surveys

### Attitude Survey of Local Businesses

Two separate forms are to be offered by an enumerator to local businesses in Berkhamsted around the High St and surrounding areas. The first is a questionnaire whereby the enumerator asks six questions – circling/ticking the persons preferred answers and writing down answers to three open ended questions. Before question 4 is asked, the enumerator is to describe the car park and show a design of the car park using the provided show card and then asks questions 4 – 6. The second form is a petition which the person can choose to sign if he/she is against the proposed building of the multi storey car park.

## **Appendix B: Contents of the USB:**

### **Filename: Survey video 30 Jan 11.20-11.45.AVI**

Video of the Lower Kings road access to the car park on 30<sup>th</sup> January 11.20 to 11.45 am

### **Filename: base\_network\_survey\_traffic\_v1.0\_2\_20\_2016 4\_13\_37 PM.mp4**

This is the PARAMICS traffic model results visualisation for the TB survey data micro-simulating the existing situation.

### **Filename: scenario1\_v1.0\_2\_20\_2016 4\_20\_27 PM.mp4**

This is the PARAMICS traffic model results visualisation from micro-simulating the situation with the MSCP.